

What is claimed is:

1. A control system for controlling a heater that heats an oxygen concentration detector provided in an exhaust passage of an internal combustion engine, when the engine is started,

the control system comprising:

detection means for detecting a start and a stop of the engine; and

control means for controlling the heater by delivering a control signal to the heater, and

wherein said control means comprises:

first setting means for setting a value of the control signal to a first predetermined value until a first predetermined time period has elapsed after the start of the engine was detected by said detection means,

second setting means for setting the value of the control signal to a second predetermined value smaller than the first predetermined value until a second predetermined time period has elapsed after the lapse of the first predetermined value, and

third setting means for setting the value of the control signal to a third predetermined value smaller than the second predetermined value after the lapse of the second predetermined time period.

2. A control system as claimed in claim 1, wherein said control means further comprises:

stoppage time period-measuring means for measuring a time period elapsed after the stop of the engine, and

first predetermined time period-setting means for setting the first predetermined time period according to the elapsed time period measured by said stoppage time period-measuring means at the start of the engine.

3. A control system as claimed in claim 1, wherein said control means further comprises:

stoppage time period-measuring means for measuring a time period elapsed after the stop of the engine,

supply time period-measuring means for measuring a supply time period over which the control signal has been supplied to the heater after the start of the engine, and

first predetermined time period-setting means for setting the first predetermined time period at a present start of the engine, according to the supply time period measured by said supply time period-measuring means during an immediately preceding start of the engine, and the elapsed time period measured by said stoppage time period-measuring means at the present start of the engine.

4. A method of controlling a heater that heats an oxygen concentration detector provided in an exhaust passage of an internal combustion engine, when the engine is started,

the method comprising the steps of:

detecting a start and a stop of the engine; and

controlling the heater by delivering a control signal to the heater, and

wherein the controlling step comprises the steps of:

setting a value of the control signal to a first predetermined value until a first predetermined time period has elapsed after the start of the engine was detected in the detecting step,

setting the value of the control signal to a second predetermined value smaller than the first predetermined value until a second predetermined time period has elapsed after the lapse of the first predetermined value, and

setting the value of the control signal to a third predetermined value smaller than the second predetermined value after the lapse of the second predetermined time

period.

5. A method as claimed in claim 4, wherein the controlling step further comprises the step of:

measuring a time period elapsed after the stop of the engine, and

setting the first predetermined time period according to the elapsed time period measured in the step of measuring the stoppage time period at the start of the engine.

6. A method as claimed in claim 4, wherein the controlling step further comprises the steps of:

measuring a time period elapsed after the stop of the engine,

measuring a supply time period over which the control signal has been supplied to the heater after the start of the engine, and

setting the first predetermined time period at a present start of the engine, according to the supply time period measured in the step of measuring the supply time period during an immediately preceding start of the engine, and the elapsed time period measured in the step of measuring the stoppage time period at the present start of the engine.

7. An engine control unit including a control program for causing a computer to control a heater that heats an oxygen concentration detector provided in an exhaust passage of an internal combustion engine, when the engine is started,

wherein the control program causes the computer to detect start and stoppage of the engine, and control the heater by delivering a control signal to the heater, and

wherein when the control program causes the computer to control the heater, the control program causes the computer to set a value of the control signal to a first predetermined value until a first predetermined time period has elapsed after the start of the engine was detected, set

the value of the control signal to a second predetermined value smaller than the first predetermined value until a second predetermined time period has elapsed after the lapse of the first predetermined value, and set the value of the control signal to a third predetermined value smaller than the second predetermined value after the lapse of the second predetermined time period.

8. An engine control unit as claimed in claim 7, wherein when the control program causes the computer to control the heater, the control program causes the computer to measure a time period elapsed after the stop of the engine, and set the first predetermined time period according to the elapsed time period at the start of the engine.

9. An engine control unit as claimed in claim 7, wherein when the control program causes the computer to control the heater, the control program causes the computer to measure a time period elapsed after the stop of the engine, measure a supply time period over which the control signal has been supplied to the heater after the start of the engine, and set the first predetermined time period at a present start of the engine, according to the supply time period measured during an immediately preceding start of the engine, and the elapsed time period measured at the present start of the engine.